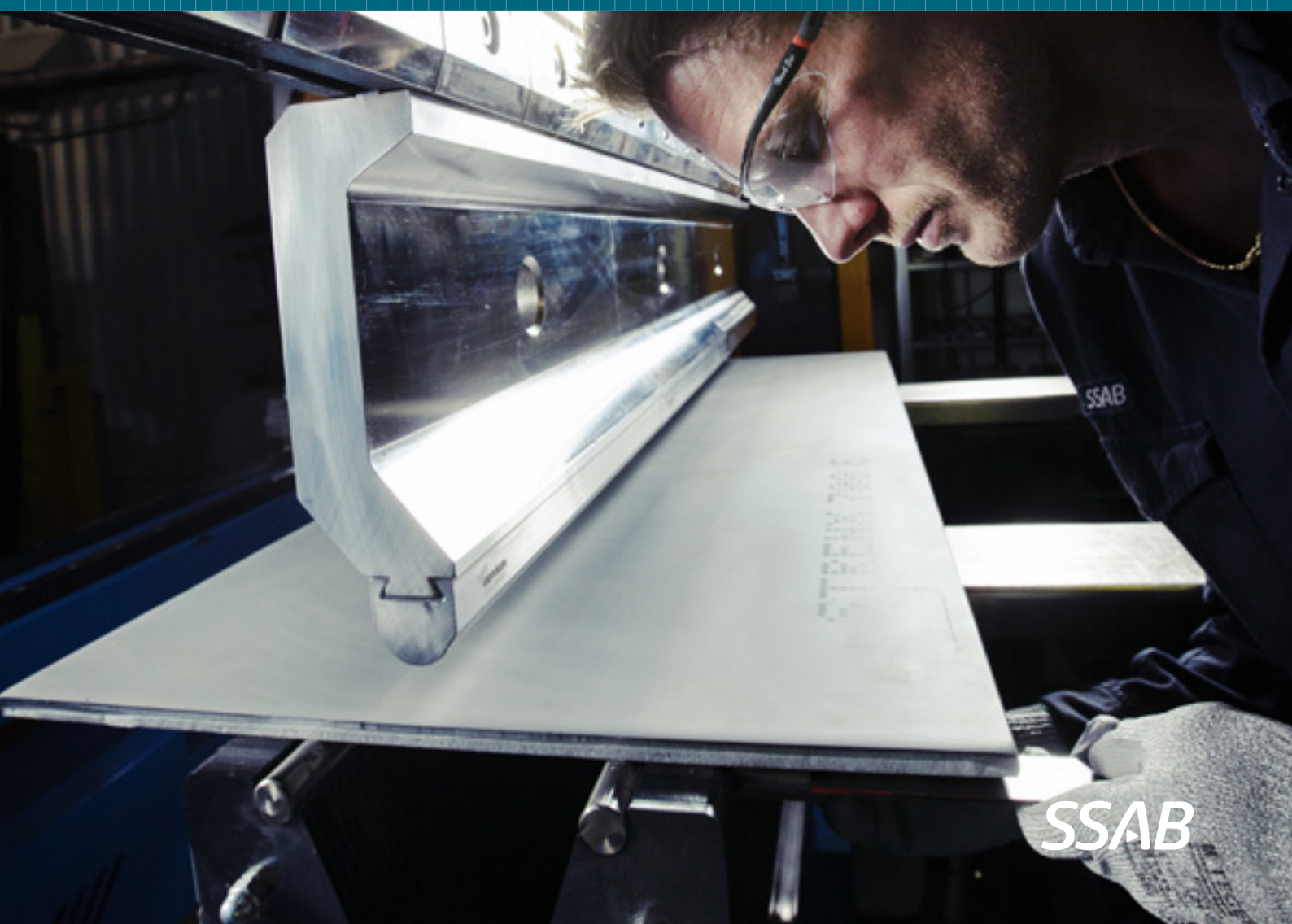


**STRENX<sup>®</sup>**  
PERFORMANCE STEEL



# STRENX<sup>®</sup> GUARANTEES

Strengthen your business with premium products made  
from high-strength structural steel with guaranteed properties



**SSAB**

# STRENX<sup>®</sup> GUARANTEES

SSAB continuously improves its production processes in order to develop new and better products. As a result, you get both closer tolerances and improved workshop properties.

Strenx<sup>®</sup> guarantees include tight thickness tolerances, tight flatness tolerances, and tight bending guarantees. These guarantees act as a complement to the Strenx<sup>®</sup> datasheets and further enhance our promise of optimal workshop performance.

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# STRENX® THICKNESS GUARANTEE

## Strenx® thickness guarantee - plate

Thickness tolerances are according to SSAB's thickness guarantee and are closer than those specified in EN 10029 except for thicknesses exceeding  $\geq 3.150''$ , for which the tolerance range is according to standard.

| Nominal thickness (inches)    | Thickness tolerances (inches) |          |              |
|-------------------------------|-------------------------------|----------|--------------|
|                               | Min                           | Max      | Within plate |
| $0.157'' \leq t < 0.197''$    | -0.012''                      | +0.012'' | 0.016''      |
| $0.197'' \leq t < 0.315''$    | -0.012''                      | +0.016'' | 0.020''      |
| $0.315'' \leq t < 0.591''$    | -0.020''                      | +0.016'' | 0.024''      |
| $0.591'' \leq t < 0.984''$    | -0.024''                      | +0.016'' | 0.024''      |
| $0.984'' \leq t < 1.575''$    | -0.028''                      | +0.031'' | 0.028''      |
| $1.575'' \leq t < 3.150''$    | -0.035''                      | +0.055'' | 0.047''      |
| $3.150'' \leq t \leq 6.299''$ | -0.043''                      | +0.083'' | 0.059''      |

Other tolerances can be supplied upon special agreement.  
Please contact your local sales representative for more information.

## Strenx® thickness guarantee - hot rolled strip

Thickness tolerances are according to SSAB's thickness guarantee and are closer than those specified in EN 10051 strip products. All values in the table conform to 1/2 EN Category D.

| Nominal thickness (inches) | Thickness tolerances for a nominal width w (inches) |                              |                              |
|----------------------------|---|------------------------------|------------------------------|
|                            | $w \leq 47.244''$                                   | $47.244'' < w \leq 59.055''$ | $59.055'' < w \leq 70.866''$ |
| $t \leq 0.079''$           | $\pm 0.005''$                                       | $\pm 0.005''$                | $\pm 0.006''$                |
| $0.079'' < t \leq 0.098''$ | $\pm 0.005''$                                       | $\pm 0.006''$                | $\pm 0.006''$                |
| $0.098'' < t \leq 0.118''$ | $\pm 0.006''$                                       | $\pm 0.006''$                | $\pm 0.007''$                |
| $0.118'' < t \leq 0.157''$ | $\pm 0.006''$                                       | $\pm 0.007''$                | $\pm 0.007''$                |
| $0.157'' < t \leq 0.197''$ | $\pm 0.007''$                                       | $\pm 0.007''$                | $\pm 0.007''$                |
| $0.197'' < t \leq 0.236''$ | $\pm 0.007''$                                       | $\pm 0.007''$                | $\pm 0.008''$                |
| $0.236'' < t \leq 0.315''$ | $\pm 0.008''$                                       | $\pm 0.008''$                | $\pm 0.008''$                |
| $0.315'' < t \leq 0.394''$ | $\pm 0.009''$                                       | $\pm 0.009''$                | $\pm 0.009''$                |
| $0.394'' < t \leq 0.492''$ | $\pm 0.009''$                                       | $\pm 0.010''$                | $\pm 0.010''$                |
| $0.492'' < t \leq 0.591''$ | $\pm 0.010''$                                       | $\pm 0.010''$                | $\pm 0.011''$                |

Other tolerances can be supplied upon special agreement.  
Please contact your local sales representative for more information.

## Strenx® thickness guarantee - cold rolled strip

Thickness tolerances are according to SSAB's thickness guarantee, which corresponds to 3/4 EN 10131 normal tolerances for cold rolled products.

| Nominal thickness (inches)    | Thickness tolerances for a nominal width w (inches) |                              |                |
|-------------------------------|---|------------------------------|----------------|
|                               | $w \leq 47.244''$                                   | $47.244'' < w \leq 59.055''$ | $w > 59.055''$ |
| $0.028'' \leq t \leq 0.031''$ | $\pm 0.002''$                                       | $\pm 0.002''$                | $\pm 0.003''$  |
| $0.031'' < t \leq 0.039''$    | $\pm 0.002''$                                       | $\pm 0.003''$                | $\pm 0.003''$  |
| $0.039'' < t \leq 0.047''$    | $\pm 0.003''$                                       | $\pm 0.003''$                | $\pm 0.004''$  |
| $0.047'' < t \leq 0.063''$    | $\pm 0.004''$                                       | $\pm 0.004''$                | $\pm 0.005''$  |
| $0.063'' < t \leq 0.079''$    | $\pm 0.005''$                                       | $\pm 0.005''$                | $\pm 0.006''$  |
| $0.079'' < t \leq 0.083''$    | $\pm 0.006''$                                       | $\pm 0.006''$                | $\pm 0.006''$  |

Other tolerances can be supplied upon special agreement.  
Please contact your local sales representative for more information.

# STRENX® LENGTH AND WIDTH GUARANTEE

## Strenx® length and width guarantee - plate

Length and width tolerances are according to those specified in EN 10029. According to EN 10029 the length of the plate is the length of the shorter of both longitudinal edges. The width should be measured perpendicular to the major axis of the plate.

| Nominal length (inches)           | Length tolerances (inches) |           |
|-----------------------------------|----------------------------|-----------|
|                                   | Min                        | Max       |
| $l < 157.480''$                   | 0                          | + 0.787'' |
| $157.480'' \leq l < 236.220''$    | 0                          | + 1.181'' |
| $236.220'' \leq l < 314.960''$    | 0                          | + 1.575'' |
| $314.960'' \leq l < 393.700''$    | 0                          | + 1.969'' |
| $393.700'' \leq l < 590.550''$    | 0                          | + 2.953'' |
| $590.550'' \leq l \leq 708.660''$ | 0                          | + 3.937'' |

| Nominal thickness (inches)    | Width tolerances (inches) |           |
|-------------------------------|---------------------------|-----------|
|                               | Min                       | Max       |
| $t < 1.575''$                 | 0                         | + 0.787'' |
| $1.575'' \leq t < 5.906''$    | 0                         | + 0.984'' |
| $5.906'' \leq t \leq 6.299''$ | 0                         | + 1.181'' |

Mill edge tolerances upon request.  
Please contact your local sale representative for more information.

## Strenx® length and width guarantee - hot and cold rolled strip

The length and width tolerances for hot rolled strip products exceeds, are more narrow than, the tolerances given in EN 10051. The length and width tolerances for Strenx® cold rolled products are according to the normal tolerances in EN 10131. The length of the cut-to-length sheet is the length of the shorter of both longitudinal edges. The width should be measured at right angles to the longitudinal axis of the product.

### Strenx® length and width guarantee

| Nominal length (inches) | Length tolerances (inches) |         |
|-------------------------|----------------------------|---------|
|                         | Lower                      | Upper   |
| 0 - 157.480''           | 0                          | 0.118'' |
| 157.519'' - 236.220''   | 0                          | 0.157'' |
| 236.259'' - 314.960''   | 0                          | 0.197'' |
| 314.999'' - 511.810''   | 0                          | 0.236'' |
| 511.849'' - 629.920''   | 0                          | 0.315'' |

| Nominal width (inches) | Width tolerances (inches) |          |               |          |
|------------------------|---------------------------|----------|---------------|----------|
|                        | Mill edge                 |          | Trimmed edges |          |
|                        | Lower                     | Upper    | Lower         | Upper    |
| $< 86.614''$           | 0                         | +0.787'' | 0             | +0.079'' |

### Length and width according to EN 10131

| Nominal length (inches) | Length tolerances (inches) |                     |
|-------------------------|----------------------------|---------------------|
|                         | Under                      | Over                |
| $l < 78.740''$          | 0                          | + 0.236''           |
| $l \geq 78.740''$       | 0                          | 0.3 % of the length |

| Nominal width (inches)       | Width tolerances (inches) |           |
|------------------------------|---------------------------|-----------|
|                              | Under                     | Over      |
| $w \leq 47.244''$            | 0                         | + 0.157'' |
| $47.244'' < w \leq 59.055''$ | 0                         | + 0.197'' |
| $w > 59.055''$               | 0                         | + 0.236'' |

# STRENX® PRODUCTS' COMPLIANCE WITH STANDARDS

All our Strenx® products comply with, or exceed, the requirements in EN 10025-6, EN 10149-2, EN 10028-6 or are according to SSAB specifications. In the case of discrepancies, the given class in the English version shall prevail.

| Product            | Conforms to standard             | Complies with     | Direction of tensile test specimen | Direction of impact toughness test specimen <sup>1)</sup> | Min. guaranteed impact properties |
|--------------------|----------------------------------|-------------------|------------------------------------|---|-----------------------------------|
| Strenx® 100        | ASTM A514                        | Grade S           | Transverse                         | Transverse  | 50 ft-lbs / -40°F                 |
| Strenx® 100 XF     | SSAB specification               | -                 | Transverse                         | Longitudinal  | 20 ft-lbs / -40°F                 |
| Strenx® 110 XF     | EN 10149-2, ASTM A1011 or A1018* | S700MC, Grade 100 | Transverse                         | Longitudinal  | 20 ft-lbs / -40°F                 |
| Strenx® 600MC D    | EN 10149-2                       | S600MC            | Longitudinal                       | Longitudinal  | 29 ft-lbs / -4°F                  |
| Strenx® 600MC E    | EN 10149-2                       | S600MC            | Longitudinal                       | Longitudinal  | 20 ft-lbs / -40°F                 |
| Strenx® 650MC D    | EN 10149-2                       | S650MC            | Longitudinal                       | Longitudinal  | 29 ft-lbs / -4°F                  |
| Strenx® 650MC E    | EN 10149-2                       | S650MC            | Longitudinal                       | Longitudinal  | 20 ft-lbs / -40°F                 |
| Strenx® 700 E      | EN 10025-6                       | S690QL            | Transverse                         | Transverse  | 50 ft-lbs / -40°F                 |
| Strenx® 700 F      | EN 10025-6                       | S690QL1           | Transverse                         | Transverse  | 20 ft-lbs / -76°F                 |
| Strenx® 700 OME    | EN 10025-6                       | S690QL            | Transverse                         | Transverse  | 50 ft-lbs / -40°F                 |
| Strenx® 700MC D    | EN 10149-2                       | S700MC            | Longitudinal                       | Longitudinal  | 29 ft-lbs / -4°F                  |
| Strenx® 700MC E    | EN 10149-2                       | S700MC            | Longitudinal                       | Longitudinal  | 20 ft-lbs / -40°F                 |
| Strenx® 700MC Plus | EN 10149-2                       | S700MC            | Longitudinal                       | Longitudinal  | 29 ft-lbs / -76°F                 |
| Strenx® 700 CR     | SSAB specification               | -                 | Longitudinal                       | -   | -                                 |
| Strenx® 700 CR W   | SSAB specification               | -                 | Longitudinal                       | -   | -                                 |
| Strenx® 700 HR W   | EN 10149-2                       | S700MC            | Longitudinal                       | Longitudinal  | 29 ft-lbs / -4°F                  |
| Strenx® P700       | EN 10028-6                       | P690Q, P690QH     | Transverse                         | Transverse  | 50 ft-lbs / -4°F                  |
|                    |                                  | P690QL1           | Transverse                         | Transverse  | 50 ft-lbs / -40°F                 |
|                    |                                  | P690QL2           | Transverse                         | Transverse  | 20 ft-lbs / -76°F                 |
| Strenx® 900 E      | EN 10025-6                       | S890QL            | Transverse                         | Transverse  | 20 ft-lbs / -40°F                 |
| Strenx® 900 F      | EN 10025-6                       | S890QL1           | Transverse                         | Transverse  | 20 ft-lbs / -76°F                 |
| Strenx® 900MC      | EN 10149-2                       | S900MC            | Longitudinal                       | Longitudinal  | 20 ft-lbs / -40°F                 |
| Strenx® 900 Plus   | EN 10025-6                       | S890QL            | Longitudinal                       | Longitudinal  | 22 ft-lbs / -40°F                 |
|                    |                                  |                   | Transverse                         | Transverse  | 20 ft-lbs / -40°F                 |
| Strenx® 960 E      | EN 10025-6                       | S960QL            | Transverse                         | Transverse  | 29 ft-lbs / -40°F                 |
| Strenx® 960 F      | EN 10025-6                       | S960QL1           | Transverse                         | Transverse  | 20 ft-lbs / -76°F                 |
| Strenx® 960MC      | EN 10149-2                       | S960MC            | Longitudinal                       | Longitudinal  | 20 ft-lbs / -40°F                 |
| Strenx® 960 Plus   | EN 10025-6                       | S960QL            | Longitudinal                       | Longitudinal  | 22 ft-lbs / -40°F                 |
|                    |                                  |                   | Transverse                         | Transverse  | 20 ft-lbs / -40°F                 |
| Strenx® 960 CR     | SSAB specification               | -                 | Longitudinal                       | -   | -                                 |
| Strenx® 960 HR W   | EN 10149-2                       | S960MC            | Longitudinal                       | Longitudinal  | 20 ft-lbs / -40°F                 |
| Strenx® 1100 E     | SSAB specification               | -                 | Transverse                         | Transverse  | 20 ft-lbs / -40°F                 |
| Strenx® 1100 F     | SSAB specification               | -                 | Transverse                         | Transverse  | 20 ft-lbs / -76°F                 |
| Strenx® 1100MC     | SSAB specification               | -                 | Longitudinal                       | Longitudinal  | 20 ft-lbs / -40°F                 |
| Strenx® 1100 CR    | SSAB specification               | -                 | Longitudinal                       | -   | -                                 |
| Strenx® 1300 E     | SSAB specification               | -                 | Transverse                         | Transverse  | 20 ft-lbs / -40°F                 |
| Strenx® 1300 F     | SSAB specification               | -                 | Transverse                         | Transverse  | 20 ft-lbs / -76°F                 |

<sup>1)</sup> Charpy V-notch impact test

\*Available on request. Please contact your local sales representative for more information.

# STRENX® FLATNESS GUARANTEE

SSAB has four classes of flatness tolerances for Strenx®, depending on type of product and material strength. All classes conform to, or are better than, the relevant standards. The flatness tolerances for class C and D fulfill the requirements in EN 10029, class A fulfills both the requirements in EN 10051 and EN 10029, and class B fulfills the requirements in EN 10131.

| Class            | Product                              | Nominal thickness (inches)  | Flatness (inches/39.370" ruler)<br>Steel flatness |
|------------------|--------------------------------------|-----------------------------|---|
| A                | Strenx® 600MC D/E                    | $0.059" \leq t \leq 0.500"$ | 0.118"  |
|                  | Strenx® 650MC D/E                    |                             |   |
|                  | Strenx® 100 XF                       |                             |   |
|                  | Strenx® 110 XF                       |                             |   |
|                  | Strenx® 700MC D/E                    |                             |   |
|                  | Strenx® 700MC Plus                   |                             |   |
|                  | Strenx® 700 HR W                     |                             |   |
|                  | Strenx® 900MC                        |                             |   |
|                  | Strenx® 900 Plus                     |                             |   |
|                  | Strenx® 960MC                        |                             |   |
|                  | Strenx® 960 Plus                     |                             |   |
|                  | Strenx® 960 HR W                     |                             |   |
|                  | Strenx® 1100MC                       |                             |   |
|                  | B                                    |                             |   |
| Strenx® 700 CR W |                                      |                             |   |
| Strenx® 960 CR   |                                      |                             |   |
| Strenx® 1100 CR  |                                      |                             |   |
| C                | Strenx® 100                          | $0.157" \leq t < 0.197"$    | 0.197"  |
|                  | Strenx® 700 E/F                      | $0.197" \leq t < 0.315"$    | 0.157"  |
|                  | Strenx® 700 OME                      | $0.315" \leq t < 1.575"$    | 0.118"  |
|                  | Strenx® P700                         |                             |   |
|                  | Strenx® 900 E/F                      | $1.575" \leq t \leq 6.299"$ | 0.118"  |
|                  | Strenx® 960 E/F                      |                             |   |
| D                | Strenx® 1100 E/F<br>Strenx® 1300 E/F | $0.157" \leq t < 0.197"$    | 0.276"  |
|                  |                                      | $0.197" \leq t < 0.236"$    | 0.197"  |
|                  |                                      | $0.236" \leq t < 0.787"$    | 0.157"  |
|                  |                                      | $0.787" \leq t \leq 1.575"$ | 0.118"  |

Class A is closer than EN 10051 and EN 10029.

Class B is closer than EN 10131 special tolerance class.

Classes C and D are closer than EN 10029 steel type L.

Short waves (11.811" - 39.370") according to EN 10029. In the case of discrepancies, the given class in the English version shall prevail.



# STRENX® BENDING GUARANTEE PLATE

SSAB has four bending guarantee classes for Strenx® plate according to the table below. The bending guarantees for Strenx® plate products are based on dies with rolls and normal friction (no lubrication). R/t stands for radius (R) divided by sheet thickness (t). These bending guarantees are based on bend tests of one step to 90° after unloading.

All classes conform to or are closer than the requirements in EN 10025-6. The bending guarantees also conform to and exceed the requirements in EN ISO 7438.

| Class | Product                            | Nominal thickness (t) (inches) | Guaranteed minimum final inner radius on plate |                              | Recommended minimum punch radius to use |                              | Die opening width (W) minimum W/t |
|-------|------------------------------------|--------------------------------|--|------------------------------|---|------------------------------|-----------------------------------|
|       |                                    |                                | Ri/t transverse to rolling direction           | Ri/t along rolling direction | Rp/t transverse to rolling direction    | Rp/t along rolling direction |                                   |
| A     | Strenx® 100                        | $t < 0.315''$                  | 1.3  | 1.8                          | 1.5                                     | 2.0                          | 10                                |
|       | Strenx® 700 E/F                    | $0.315'' \leq t < 0.591''$     | 1.3  | 1.8                          | 1.5                                     | 2.0                          | 10                                |
|       | Strenx® P700                       | $0.591'' \leq t < 0.787''$     | 1.7  | 2.1                          | 2.0                                     | 2.5                          | 12                                |
|       | Strenx® 700 OME                    | $t \geq 0.787''$               | 1.7  | 2.1                          | 2.0                                     | 2.5                          | 12                                |
| B     | Strenx® 900 E/F<br>Strenx® 960 E/F | $t < 0.315''$                  | 2.3  | 2.5                          | 2.5                                     | 3.0                          | 12                                |
|       |                                    | $0.315'' \leq t < 0.591''$     | 2.3  | 2.6                          | 2.5                                     | 3.0                          | 14                                |
|       |                                    | $0.591'' \leq t < 0.787''$     | 2.4  | 2.7                          | 2.5                                     | 3.0                          | 14                                |
|       |                                    | $t \geq 0.787''$               | 2.8  | 3.4                          | 3.0                                     | 3.5                          | 16                                |
| C     | Strenx® 1100 E/F                   | $t < 0.315''$                  | 2.8  | 3.3                          | 3.0                                     | 3.5                          | 12                                |
|       |                                    | $0.315'' \leq t < 0.591''$     | 2.6  | 3.2                          | 3.0                                     | 3.5                          | 14                                |
|       |                                    | $0.591'' \leq t < 0.787''$     | 2.5  | 3.1                          | 3.0                                     | 3.5                          | 14                                |
|       |                                    | $t \geq 0.787''$               | 3.0  | 3.5                          | 3.5                                     | 4.0                          | 16                                |
| D     | Strenx® 1300 E/F                   | $t < 0.315''$                  | 3.1  | 3.8                          | 3.5                                     | 4.0                          | 14                                |
|       |                                    | $0.315'' \leq t \leq 0.591''$  | 3.6  | 4.3                          | 4.0                                     | 4.5                          | 14                                |

The guaranteed values for bending are valid under conditions given in the brochure Bending of Strenx®. In the case of discrepancies, the given class in the English version shall prevail.

# STRENX® BENDING GUARANTEE STRIP

The bending guarantees and recommendations for Strenx® strip products are based on dies with rolls and normal friction (no lubrication). R/t stands for radius (R) divided by sheet thickness (t). These bending guarantees are based on bend tests of one step to 90° after unloading. Die opening widths are guidelines and may vary somewhat without affecting bending results.

Both Strenx® hot rolled and cold rolled strip steels have a guaranteed minimum bending radius valid for both longitudinal and transversal directions. For the hot rolled materials, the guarantees are closer than the requirements in EN 10149. The guaranteed values can also be found in respective data sheet.

| Product                             | Nominal thickness (t) (inches) | Guaranteed minimum final inner radius on sheet |                              | Recommended minimum punch radius to use |                              | Die opening width (W) min W/t |
|-------------------------------------|--------------------------------|--|------------------------------|---|------------------------------|-------------------------------|
|                                     |                                | Ri/t transverse to rolling direction           | Ri/t along rolling direction | Rp/t transverse to rolling direction    | Rp/t along rolling direction |                               |
| Strenx® 600MC D/E                   | $t \leq 0.118''$               | 0.7  | 0.7                          | 0.7                                     | 0.7                          | 10                            |
|                                     | $0.118'' < t \leq 0.236''$     | 1.1  | 1.1                          | 1.1                                     | 1.1                          | 10                            |
|                                     | $t > 0.236''$                  | 1.4  | 1.4                          | 1.4                                     | 1.4                          | 10                            |
| Strenx® 650MC D/E<br>Strenx® 100 XF | $t \leq 0.118''$               | 0.8  | 0.8                          | 0.8                                     | 0.8                          | 10                            |
|                                     | $0.118'' < t \leq 0.236''$     | 1.2  | 1.2                          | 1.2                                     | 1.2                          | 10                            |
|                                     | $t > 0.236''$                  | 1.5  | 1.5                          | 1.5                                     | 1.5                          | 10                            |
| Strenx® 700MC D/E<br>Strenx® 110 XF | $t \leq 0.118''$               | 0.8  | 0.8                          | 1.0                                     | 1.0                          | 10                            |
|                                     | $0.118'' < t \leq 0.236''$     | 1.2  | 1.2                          | 1.4                                     | 1.4                          | 10                            |
|                                     | $t > 0.236''$                  | 1.6  | 1.6                          | 1.7                                     | 1.7                          | 10                            |
| Strenx® 700 HR W                    | $0.118'' \leq t \leq 0.236''$  | 1.2  | 1.2                          | 1.4                                     | 1.4                          | 10                            |
|                                     | $t > 0.236''$                  | 1.6  | 1.6                          | 1.7                                     | 1.7                          | 10                            |
| Strenx® 700MC Plus                  | $0.118'' \leq t \leq 0.394''$  | 1.0  | 1.0                          | 1.3                                     | 1.3                          | 10                            |
|                                     | $t > 0.394''$                  | 1.5  | 1.5                          | 1.8                                     | 1.8                          | 10                            |
| Strenx® 700 CR                      | $0.028'' \leq t \leq 0.083''$  | 2.0  | 2.0                          | 2.5                                     | 2.5                          | 10                            |
| Strenx® 900MC                       | $0.118'' \leq t \leq 0.315''$  | 3.0  | 3.0                          | 3.0                                     | 3.25                         | 12                            |
|                                     | $t > 0.315''$                  | 3.5  | 3.5                          | 3.5                                     | 3.75                         | 12                            |
| Strenx® 900 Plus                    | $0.079'' \leq t \leq 0.315''$  | 3.0  | 3.0                          | 4.0                                     | 4.0                          | 12                            |
| Strenx® 960MC                       | $0.118'' \leq t \leq 0.394''$  | 3.5  | 3.5                          | 3.6                                     | 4.0                          | 12                            |
| Strenx® 960 HR W                    | $0.118'' \leq t \leq 0.240''$  | 3.5  | 3.5                          | 4.0                                     | 4.0                          | 12                            |
| Strenx® 960 Plus                    | $0.079'' \leq t \leq 0.315''$  | 3.5  | 3.5                          | 4.0                                     | 4.2                          | 12                            |
| Strenx® 960 CR                      | $0.028'' \leq t \leq 0.083''$  | 3.5  | 3.5                          | 4.5                                     | 4.5                          | 12                            |
| Strenx® 1100MC                      | $0.118'' \leq t \leq 0.315''$  | 4.0  | 4.0                          | 4.7                                     | 5.0                          | 14                            |
| Strenx® 1100 CR                     | $0.028'' \leq t \leq 0.083''$  | 3.5  | 3.5                          | 4.5                                     | 4.5                          | 14                            |

The guaranteed values for bending are valid under conditions given in the brochure Bending of High Strength Steel. In the case of discrepancies, the given class in the English version shall prevail.

# FLATNESS, EDGE CAMBER & OUT-OF-SQUARENESS

The information below is a presentation of how to inspect your SSAB deliveries using the product guarantees. This information is according to EN 10029 for plate, EN 10051 for hot rolled cut-length-sheet and EN 10131 for cold rolled cut-length-sheet. For more information, please contact your local sales representant or Tech Support.

## Flatness measurement

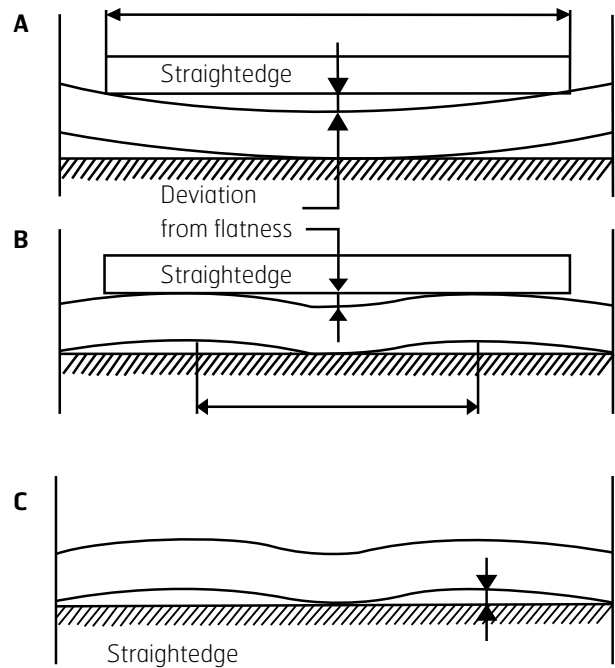
To determine the flatness deviation during production, the plate/ sheet is measured manually or by laser. The measurement conforms to the manual procedure according to EN 10029 and EN 10051.

Flatness measurement for plate is according to EN 10029. The plate is measured at least 0.984" from the long side of the plate and at least 7.874" from its short side.

The vertical height is rounded off to the nearest mm. See figure A and B.

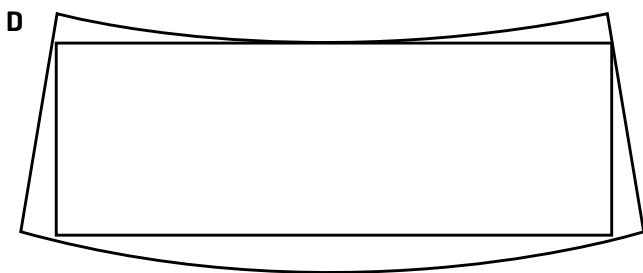
Flatness measurement for cut-to-length sheet is according to EN 10051. Flatness deviation for sheet is determined by measuring the deviation in distance between the product and a flat horizontal surface on which the sheet is placed.

The vertical height is rounded off to the nearest mm. See figure C.



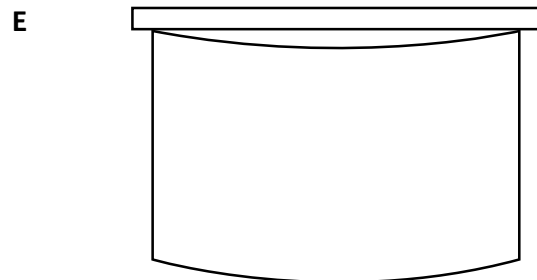
## Edge camber and out-of-squareness plate

According to EN 10029, it must be possible to inscribe a rectangle having the dimensions of the ordered plate within the plate supplied. See figure D.



## Edge camber and out-of squareness sheet

According to EN 10051, the edge camber is the maximum deviation of a longitudinal edge from a straight edge measuring base applied to it. The camber is measured on the concave edge. See figure E.



# STRENX® TUBES & SECTIONS

SSAB is a producer of high-quality tubes and sections in most of our product families. For more information on dimensions, lengths and other requirements, please see the respective data sheets, contact your local sales representative or contact Tech Support.

## Strenx® tubes

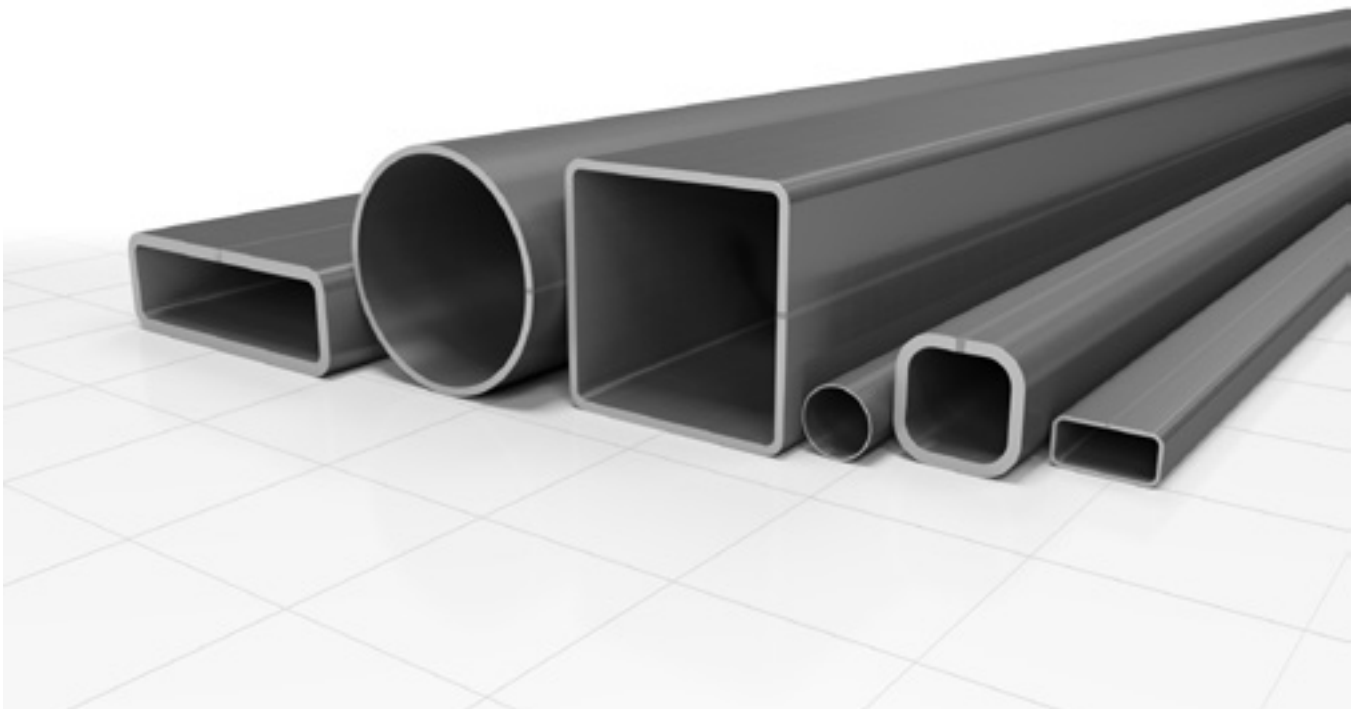
SSAB offers three product types for our Strenx® tubes, MH, MLH and QLH, in different grades, shapes and in several yield strengths. Strenx® tubes MH and MLH material are HF-welded cold-formed structural hollow sections made of hot-rolled high-strength steel. They meet or exceed the requirements of EN 10219. CE-marking according to EN 1090-2 is available up to yield strength 101 ksi.

Strenx® tube QLH material comes as plasma-welded, quenched and tempered. It meets or exceeds the requirements of EN 10210.

## Strenx® sections

Strenx® section is a cold-formed steel section made of hot-rolled, high-strength steel with minimum yield strengths of 94, 101 or 130 ksi. The steel in Strenx® section meets or exceeds the requirements of EN 10149-2. Strenx® section's tolerances meet or exceed, when applicable, the requirements of EN 10162.

Strenx® section are available as U-section, but other shapes and variations are available upon request. The maximum length of the sections is 826.770".



# TESTING STRENX® PRODUCTS

Unless otherwise agreed, inspection and testing are carried out and the results are reported as specified in the relevant material standard or in our data sheets. When placing your order, always specify whether the material requires special inspection, the scope of such an inspection, and the type of inspection document required.

## Mechanical testing

Tensile testing in accordance with ISO 6892-1 or appropriate ASTM or national standard.  
Impact testing in accordance with ISO 148-1 or appropriate ASTM or national standard.  
Tensile testing in the thickness direction in accordance with EN 10164 or appropriate ASTM or national standard.

## Ultrasonic testing

Ultrasonic testing is performed after agreement according to EN 10160, or equivalent national standard. SSAB guarantees internal soundness corresponding to EN 10160 class E<sub>1</sub>S<sub>1</sub> for plates in thickness up to and including 3.937". For plates above 3.937" thickness, SSAB guarantees internal soundness corresponding to Corresponding to EN 10160 class E<sub>0</sub>S<sub>0</sub>, unless otherwise agreed. For more information, please contact your local sales representative.

## Through thickness testing

Through thickness testing is performed after agreement according to EN 10164, or equivalent national standard. All Strenx® plate products can be delivered with guaranteed properties in the through thickness direction. The available classes depend on product and dimensions. For more information, please contact your local sales representative.

# DISTRIBUTION OF INSPECTION DOCUMENTS

SSAB has a certificate system that electronically produces, distributes and records all types of inspection documents. The documents are delivered electronically as PDF files. The certificate system offers excellent opportunities for simple and rational handling of inspection documents.

## Inspection documents

Unless otherwise agreed, certificates are issued in English in accordance with SS-EN 10204:2004. The certificates include the particulars specified in the material standard, which usually include:

- Name of manufacturer.
- Clear reference to the purchase agreement and delivery batch.
- Material designation in accordance with the purchase agreement.
- Description of product.
- Nominal dimensions.
- Quantity.
- Results of inspection.
- Date of issue.

The following types are available:

### Inspection certificate 3.1

The inspection certificate declares that the products delivered conform to the requirements of the purchase agreement. The results of testing are shown for the products that will be delivered or on inspection batches comprising part of the products delivered. The document is validated by an inspection representative who is authorized by the manufacturer and who is independent of the production department.

### Inspection certificate 3.2

The inspection certificate declares that the products delivered conform to the requirements of the purchase agreement. The results of testing are shown for the products that will be delivered or on inspection batches comprising part of the products delivered. Document issued both by the inspection representative authorized by the manufacturer and either by an inspection representative authorized by the customer or by an inspector appointed in accordance with official regulations.

# MARKING STRENX® PRODUCTS

All products are clearly marked on delivery. The steel grade and the product identity are stamped, unless the relevant standard specifies no stamping or after special agreement. For products with thicknesses of 0.197" or less and if stamping is not carried out for any other reason, stamping is replaced by marking with white paint.

## Product identity

All production systems (works, plants, facilities) within the SSAB group have their own production identity systems and identity codes. The product identity code combines numbers, letters and symbols in one text string. The maximum number of characters is 25. The product identity is unique and consists of two groups or three groups of characters, with each group containing up to six or seven characters, respectively. These groups of characters give every product a unique identity. Example of product identities from SSAB are listed below. For certain production facilities, the location of the stamped marking may be shown by two white-painted dots.

Contact your local sales representative for more detailed options.

Heat number (6) - Serial number (6 or 7) = 13 - 14 characters.

Example: 095150 - 555621.

Heat number (6) - Serial number (6 or 7) - Stock item number (4) = 18 - 19 characters.

Example: 097495 - 7569850 - 4910.

Heat number (6) - slab number-plate number - bundle number.

Example: A19123 - ABC12 - A12 - 1234567.

Coil number (5-7) - Bundle number (1 - 3) = 9 - 11 characters.

Example: C89613 - 10 (or HC89613 - 10 on Odette label).

Product ID (6 - 3 - 3) = 14 characters.

Example: W7C123 - A05 - A01.

Product ID (X - X - X) = X characters.

Example: 095150 - 555621 - 001.

## Marking and stamping

The steel grade and plate identity are always low-stressed stamped perpendicular to the rolling direction. For products without stamping, the steel grade and product identity are marked and the rolling direction is ink marked with arrows. Marking with paint may be carried out in the direction of rolling.

The customer's mark, product dimensions of length, width and thickness dimensions, product identity and the pile number for internal use are marked on the product. The marking is performed with white paint dot-matrix printing or black ink jet marking. The location of the stamp is occasionally indicated with two white-painted dots.

## Brand marking

Unless otherwise agreed, to maintain traceability of the material at its destination SSAB's products are marked as follows: Painted product is normally marked in a number of rows over the entire product surface. Unless otherwise agreed, a simplified steel grade designation and SSAB are painted. The product identity number can also be marked in rows over the product surface.

Note that the complete steel grade designation in accordance with the standard/data sheet or specification is stamped or is included in the paint marking.

# ANTI-CORROSION PAINTING STRENX® PRODUCTS

Unprotected steel plate will corrode. SSAB can therefore provide the plate with effective anti-corrosion treatment known as shop primer. This protects the product while it is in transit.

The primer types we use have been tested by various institutes to ensure good working conditions for the end user. If good ventilation is provided, the hygienic limit values will not be exceeded in conjunction with welding, cutting or grinding.

Regardless of the anti-corrosion treatment specified, the appearance and cleanliness of the steel surface before treatment are decisive for the effectiveness of the anti-corrosion treatment. We shot-blast the plate, which is then immediately anti-corrosion painted. The primers used are mainly of low-zinc silicate.

The plate we keep in stock is painted with a low-zinc silicate primer, since it does not need to be removed before normal welding. If there is a high demand on the weld quality, or if the welding is performed on materials with low heat input, then SSAB recommends that the primer shall be removed. More welding recommendations can be found in SSAB's brochure Welding of Strenx®.

Strenx® is primed with a grey color unless otherwise agreed. Before selecting the final paint system, the relevant paint supplier should be consulted.

## Shop primer

| Type     | Color | Protection time |
|----------|-------|-----------------|
| Low zinc | Grey  | 6 months        |

Degree of blasting SA 2.5 as per ISO 8501-1.



# SURFACE TREATMENT OF STRENX<sup>®</sup> SHEET AND COIL

SSAB offers different types and degrees of oiling as a surface treatment for the pickled material. Both hot and cold rolled material can be surface treated by oiling. The purpose of the oil is to protect the steel during transport.

SSAB offers both untreated and oiled surfaces for Strenx<sup>®</sup> products. The standard oil for surface treatment is anti-corrosion oil. Depending on the product or thickness, different oiling alternatives are available. Please contact your local sales representative for support to find out the most appropriate and available surface treatment.

For Strenx<sup>®</sup>, there are several different degrees of oiling: lightly oiled, normally oiled, heavily oiled, very lightly oiled and lightly oiled, upper side. The various degrees of oiling give the following results:

## Untreated

Patches of oil may occur on delivery of untreated material. In this case, the customer must be informed that the risk of rust is considerable and that the customer is liable for any damage due to rust.

## Very lightly oiled

Gives a very limited amount of rust protection.

## Lightly oiled, upper side

Gives a very limited amount of rust protection.

## Lightly oiled

Gives some amount of rust protection and a liberal portion of oil on the outer and inner laps. Occasional dry patches occur.

## Normally oiled

Gives an unbroken oil cover with excess of oil at the ends.

## Heavily oiled

Gives an unbroken oil cover with more or less excess of oil all over the band/strip.

# PACKING GUIDELINES FOR STRENX® SHEET

SSAB offer different packing options for cut-to-length sheets. Strenx® sheets are produced and packed at different locations, so the packing alternative may differ. When placing your order, always specify whether the material is to be subjected to special agreement.

SSAB has three different packing alternatives for cut-to-length sheet: Base, Light and Export. Their basic function is to protect the sheet during transportation. The packing does not provide any guaranteed protection against corrosion or handling damage.

There are several options and different packing types. Packaging will be planned together with sales support to determine the most appropriate practice.

## Quantities per package of Strenx® hot and cold rolled sheet

| Product                   | Package weight (ton*) |        | Package height (inches) |         |
|---------------------------|-----------------------|--------|-------------------------|---------|
|                           | Min                   | Max    | Min                     | Max     |
| Strenx® hot rolled sheet  | 0.661                 | 17.637 | 1.181"                  | 23.622" |
| Strenx® cold rolled sheet | 1.323                 | 8.598  | 1.181"                  | 14.961" |

Bundle height including pallet for cold rolled sheet 5.354"-19.134".

\*ton stands for short tons (us)

## Available packing types

- Stretchfilm covering front end of bundle for label attachment.
- Plastic foil.
- Paper foil.
- Stretchfilm covering whole bundle.
- Edge protection profiles covering the upper longitudinal edges.
- Cross strapping with strapped interlayers.
- Pallet, nailed or glued.
- Identity label on shortside and longside.

# PACKING GUIDELINES FOR STRENX® COIL

SSAB offers a broad range of packing options for our Strenx® coils. The coils are produced and packed at different locations, so the packing alternatives may differ. When placing your order, always specify whether the material should be subject to special agreement.

As for cut-to-length sheets, SSAB has three different packing alternatives for coils: Base packing, Light packing and Export packing. Their function is to protect the coil during transportation. The packing does not provide any guaranteed protection against corrosion or handling damage. Below you will find examples of the most common packing options used.

## Base packing

This packing is a bare transport packing providing limited protection where the protective rings are applied. Otherwise no protection against corrosion or handling. In its lightest form, only circumferential strapping is applied. Base packing is suitable for transport by covered truck or by rail.

- Edges, outer: No edge cover.
- Edges, rings: Plastic or steel.
- Protection layer: No layer.

## Light packing

This packing provides limited protection against dust and humidity. It provides good protection against dents on a mantel surface, but limited protection in the center eye where the rings are applied. Suitable for covered truck or by rail.

- Edges, outer: Steel or plastic.
- Edges, rings: Steel or plastic.
- Eye: paper or plastic wrapping thought the eye. Cardboard protection may be used.
- Protection layers: PE wrapping or foil and laminate mantel.

## Export packing

Reinforced export packing designed mainly for storage and port handling. The packing provides good protection against dust, humidity, corrosion, dents and other damage under normal conditions. Fullfills all transport regulations.

- Edges outer: Outer rings in steel.
- Edges, rings: Steel or plastic.
- Eyes: Plastic, paper or PE wrapping.
- Wall: Often cardboard, plastic may be used.
- Mantel: Cardboard or laminate. Under mantel layer Paper, foil or PE paper under the mantel layer.

## Hot rolled slitted coil packing

SSAB also offers hot rolled slitted coils in the same packing arrangement as above. Base packed slitted coils are strapped on pallets. Light packed slitted coiled are plastic foiled on a pallet. Export packed slitted coils are foil-wrapped, with edges covered and have plastic rings. Please contact your local sales representative for more infomation regarding a suitable packing alternative.

# PALLETIZING STRENX® PLATE

Our delivery standard presents rules and guidelines for palletizing the deliveries. Please note that Strenx® plates are produced and delivered from different locations, so the palletizing options may differ. When placing your order, always specify whether the material should be subject to special agreement.

The aim of the standard is to palletize the material in a way that avoids handling damage to the greatest extent possible, and that creates cost-effective and manageable volumes.

For deliveries in which SSAB is responsible for loading, the goods are always secured in accordance with the laws and regulations in force at that time. To regulate who pays for freight and insurance, we apply either CIP or CIF 2020 delivery conditions.

## Definitions

|              |  |
|--------------|--|
| Pallet       | A platform loaded with packages. The pallets are separated with timber spacers measuring 2.480" x 3.543".  |
| Stack        | A partial load on a pallet. Separated from other stacks by timber spacers measuring 1.260" x 1.260".   |
| Pallet label | A label attached to the top plate on a pallet containing the printed pallet number, bar code, painted color code, quantity, weight, and the identity of the top plate. |
| Color        | Painted color coding on the short and/or coding long side of the plate for delivery by sea.  |
| Short plate  | Plate < 240.157" long.   |

## General pallet rules

- The maximum pallet weight is 13.228 tons (us). Short and long plates are never loaded on the same pallet, when ordered from stock.
- Thick and thin plates are never loaded on the same pallet.
- Painted and unpainted plates are never loaded on the same pallet.
- The widest plate is always at the bottom on the pallet.
- Graduated width loading (widest plate on the pallet, gradually diminishing to the narrowest at the top) is employed for plate thicknesses <1.185".
- Random length loading (plates of different lengths are loaded in random order) is employed.
- Some thin plate may be strapped.
- Magnetic pallet label.

## Options

- Strapping with steel straps around both the pallet and the stack. 240.118" maximum plate length.
- Stack weights as agreed.
- Pallet weights as agreed.
- Special color coding.
- Delivery codes outside the standard.
- Other requirements on dimensional separation.

## Optional marking

- On the top plate on a pallet or stack. Up to 3 lines with 21 characters (manuell marking)\* stack, up to 3 lines.
- Edge label attached on the thickness surface of the short side. Available in three variants with different information about the plate. Edge label possible above 0.315" thickness.

\*Carried out free of charge, if required.

# PALLETIZING STRENX® SHEET

Our delivery standard presents the rules and options for bundling and palletizing the deliveries. Please note that Strenx® cut-to-length sheets are produced and delivered from different locations, so the palletizing options may differ. When placing your order, always specify whether the material should be subject to special agreement.

The aim of the standard is to palletize the material in a way that avoids handling damage and that creates cost-effective and manageable volumes.

For deliveries in which SSAB is responsible for loading, the goods are always secured in accordance with the laws and regulations in force at that time. To regulate who pays for freight and insurance, we apply either CIP or CIF 2020 delivery conditions. Exceptions can be made for certain conditions.

## Definitions

|              |  |
|--------------|--|
| Pallet       | A platform loaded with packages. The pallets are separated with timber spacers measuring 2.835" x 2.835" or 3.543" x 3.543". |
| Stack        | A partial load on a pallet. Separated from other stacks by timber spacers measuring 1.260" x 1.260".                         |
| Bundle       | A single brand of sheets packed together.  |
| Pallet label | Identity label on shortside and longside.  |
| Edges        | Edge protection profiles covering the upper longitudinal edges.  |

## General pallet rules

- The maximum pallet length is 629.920".
- All sheets on the same pallet have the same dimension.
- Short and long sheets are never loaded on the same pallet.
- All sheets can be stacked.
- Wood secured to bundle.

## Storing recommendations

- Dry environment.

## Options

- Stack weights as agreed.
- Pallet weights as agreed.
- Special color coding/packing.
- Delivery codes outside the standard.
- Other requirements on dimensional separation.

# LOGISTICS STRENX® COIL

Our delivery standard presents our recommendations for transport, storage and handling of Strenx® coils. All packing alternatives have different demands on the logistics process. Note that Strenx® coils are produced and delivered from different locations, so the packing and logistic alternatives may differ. When placing your order, always specify whether the material should be subject to special agreement.

For deliveries in which SSAB is responsible for loading, the goods are always secured in accordance with the laws and regulations in force at that time. To regulate who pays for freight and insurance, we apply either CIP or CIF 2020 delivery conditions. Exceptions can be made for certain conditions.

## Base packing

### Transport

- The packing fulfills the transport regulation for truck and rail.
- Due to risk for corrosion the transport time should not exceed 24 hrs.
- Coils must be transported in covered carriers.
- Carriers must be clean from stones, gravel etc. and designed to prevent dents or other damage.

### Storage

- Storage in dry environment. All storage poses the risk of corrosion.
- Material can be stacked in two layers. Recommended one-level stacking for pre-painted material, but with good handling two-level is acceptable.
- Storage saddles must be clean from stones, gravel etc. and designed to prevent dents or other damage.

### Handling

- Handling with tongs, C-hook or peak truck.

## Light packing

### Transport

- The packing fulfills the transport regulation for truck and rail.
- Coils must be transported in covered carriers.
- Carriers must be clean from stones, gravel etc. and designed to prevent dents or other damage.

### Storage

- In dry environment.
- Material can be stacked in two levels.
- Storage saddles must be clean from stones, gravel etc. and designed to prevent dents or other damage.

### Handling

- Handling with tongs, C-hook or peak truck.

## Export packing

### Transport

- Coils must be transported in covered carriers.
- Carriers must be clean from stones, gravel etc. and designed to prevent dents or other damage.

### Storage

- In dry environment.
- Material can be stacked in two levels.
- Storage saddles must be clean from stones, gravel etc. and designed to prevent dents or other damage.

### Handling

- Handling with tongs, C-hook or peak truck.

# SERVICE AND SUPPORT

SSAB offers extensive service and support to customers. We have a long tradition of helping customers to develop their steel products and processes with our unique knowledge. Unlike other steel companies, SSAB offers two different services, Tech Support and the Knowledge Service Center. We offer technical and innovation support as well as technical training, handbooks and tools to help you become more productive.

SSAB offers advanced logistics solutions, including stock services worldwide, mill-direct deliveries, processing and logistics management solutions.

## CONTACT INFORMATION

[www.strenx.com](http://www.strenx.com)

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SSAB is a Nordic and US-based steel company that builds a stronger, lighter and more sustainable world through value added steel products and services. Working with our partners, SSAB has developed SSAB Fossil-free™ steel and plans to reinvent the value chain from the mine to the end customer, largely eliminating carbon dioxide emissions from our own operations. SSAB Zero™, a largely carbon emission-free steel based on recycled steel, further strengthens SSAB's leadership position and our comprehensive, sustainable offering independent of the raw material. SSAB has employees in over 50 countries and production facilities in Sweden, Finland and the US. SSAB is listed on Nasdaq Stockholm and has a secondary listing on Nasdaq Helsinki. Join us on our journey! [www.ssab.com](http://www.ssab.com).



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